



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231

Inventor: **Johnson, H. et al.**

Serial No: **09/933,596**

Filed: **August 20, 2001**

For: **Configurations and Methods  
for Improved Copper  
Distribution Uniformity in  
Printed Wiring Boards**

Examiner: **Tuan T. Dinh**

Art Unit: **2827**

**RESPONSE TO OFFICE ACTION**

The Honorable Commissioner  
of Patents and Trademarks  
Washington, D.C. 20231

Dear Sir:

This paper responds to the Office Action dated October 21, 2002. Please enter the following:

**IN THE CLAIMS**

Cancel claims 7 and 9, and amend claims 1, 6, and 8 as shown.

1. An electronic device comprising:

a dielectric substrate having a first surface and a second surface, and a via connecting the first and second surfaces, wherein the via has a horizontal cross sectional area substantially coplanar with the first or second surface;

a first and a second sacrificial copper structure deposited onto the first and the second surface and surrounding the via, respectively, wherein each of the first and second

sacrificial copper structures covers an area of no more than three times the horizontal cross sectional area of the via; and

a via fill material disposed within the via, on the first and second sacrificial copper structure, and at least partially on the first and second surface;

wherein the first and the second sacrificial copper structures are formed on the substrate via a photolithographic process.

6. The electronic device of claim 1 wherein the via has a via diameter, wherein the first and second sacrificial copper structures have a first and second structure diameter, respectively, and wherein at least one of the first and second structure diameters are 150 micrometers larger than the via diameter.
8. The electronic device of claim 1 wherein the via fill material comprises a resin.

## **REMARKS**

### **Drawing Objections**

The Examiner objected to the drawings as failing to include cross-hatching. Proposed drawing changes are included herein.

### **35 USC § 112**

Claim 6 was rejected under 35 U.S.C. §112 as containing the term microns. In response, the claim has been amended to recite “micrometers” rather than “microns”. No new matter was added..

### **35 USC § 102**

**Claims 1-10** were rejected under 35 USC § 102(e) as being anticipated by Lubert et al. (U.S. Pat. No. 6,291,779). The applicant disagrees, especially in view of the amendments set forth herein. As amended herein, claim 1 (and claims 2-10 by virtue of their dependence on amended claim 1) all recite that “...each of the first and second sacrificial copper structures covers an area of no more than three times the horizontal cross sectional area of the via...” and “... a via

fill material disposed within the via, on the first and second sacrificial copper structure, and at least partially on the first and second surface...". None of the cited references teach or suggest an electronic device comprising the claimed sacrificial structures and claimed fill material. As such, claims 1-10 are patentable over the cited references.

**ATTACHED MARKED-UP VERSION OF CHANGES**

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

**REQUEST FOR ALLOWANCE**

Claims 1-10 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,

Rutan & Tucker, LLP

Dated: December 17, 2002

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